TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 616

Red Pine Plantation With 48 Sources of Seed Shows Little Variation in Total Height at 27 Years of Age

In 1937 red pine seedlings from 48 individual seed sources in the Lake States (including one from nearby Angus, Ontario, Canada) were planted in a 1.4-acre plantation on the Pike Bay Experimental Forest near Cass Lake, Minn. The trees, 2-1 transplants, came from seed left over from the supply used for the original seed source plantations of 1931 and 1933. These had been inadvertently destroyed.

The plantation was thinned in 1951, 1956, and 1961 to give adequate growing room to all seed sources. In general, trees poorer in form and smaller than average were removed in thinning. The 48 seed sources were spaced throughout the plantation in 92 rows. Each seed source appeared in one or more rows; each source row contained at least four trees of the source; each source row was treated as a separate observation. There was no evidence of a site gradient in the plantation.

Twenty-four years after planting, or 27 years from seed, the height of each tree of a given source was measured and the average height calculated. The results are given in table 1. The seed sources are arranged by regional groupings as proposed by Rudolf[1/] for the Camp 8 source-of-seed plantation near Ely, Minn.

There was no significant difference in average tree height between the eight regional groupings. The mean height for all seed sources is 39.8 feet; the regional averages depart from this mean by no more than 0.7 feet.

There was no significant difference in average tree heights within regional groupings except for the head-of-the-lakes and the Lower Michigan sources. In the head-of-the-lakes region, the Ashland, Wis., seed source is suspected of being inferior. This seed source is 2.5 feet shorter than the regional mean of 39.3 feet. In the Lower Michigan seed sources there is apparently more variability in average tree heights than in other regions. No one source is better than the best from other regions, nor is the poorest (Bay City, Mich.) poorer than the worst from other regions.

This study, up to this date at least, suggests that red pine exhibits less racial variation in height growth than do most pines. With one possible inferior source (Ashland, Wis.), none of the seed sources appear to have markedly better or worse height growth than other seed sources.

From the silvicultural standpoint, the most striking feature of this plantation is its per-acre growth rate. Counting thinnings and present standing volume, the plantation has produced 36.5 cords of wood per acre in 27 years from seed.[2/]

[1/] Rudolf, Paul O. Importance of red pine seed source. Soc. Amer. Foresters Proc. (1947 meeting): 384-398. 1947.

[2/] See the following reference for utilization standards and growth rates up to 22 years from seed: Zasada, Zigmond A., and Buckman, Robert E. Growth and yield of a young plantation in northern Minnesota. U. S. Forest Serv. Lake States Forest Expt. Sta. Tech. Note 491, 2pp. 1957.

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MAINTAINED AT ST. PAUL 1, MINNESOTA, IN COOPERATION WITH THE UNIVERSITY OF MINNESOTA

Table 1.--Average height of red pine from 48 seed sources in the Lake States 24 years after planting

Collection no.	Origin	Number rows planted	Avg. height (feet)
	NORTHWESTERN MINNESOTA		
76	Ponsford	2	39.1
143	Cass Lake	1	41.2
144	Cass Lake	2	39.7
146	Hibbing	2	39.4
176	Menahga	2	41.0
178	Itasca Park	4	41.4
179	Itasca Park	3	39.2
180	Bemidji-Wilton	2	38.2
181	Bagley	1	39.7
188	Cass Lake	3	39.5
324	Itasca Park	4	40.1
	Regional average		39.9
	BRAINERD, MINNESOTA-CAMERON, WISCONSIN		
75	Onamia, Minn.	5	40.0
148	Moose Lake, Minn.	2	39.9
158	Taylors Falls, Minn.	2	39.5
160	Cameron, Wis.	2	40.6
161	Cameron, Wis.	2	40.3
162	Cameron, Wis.	2	38.4
172	Brainerd, Minn.	1	41.8
174a	Brainerd, Minn.	1	40.6
	Regional average		40.1
	NORTHEASTERN MINNESOTA		
35	Ely	2	38.3
36	Aurora	2	41.1
37	Virginia	2	39.5
183	Warroad	2	39.8
	Regional average		39.7
	UPPER PENINSULA, MICHIGAN		
237	Bruce Crossing	2	39.5
240	Baraga	1	39.9
	Regional average		39.7
	HEAD-OF-THE-LAKES		
24	Barnes, Wis.	2	39.7
48	Ashland, Wis.	2	36.8
141	Scanlon-Carlton, Minn.	2	40.9
165	Cedar, Wis.(Iron Co.)	2	38.3
167	Red Cliff, Wis.	1	38.8
168	Portwing, Wis.	1	39.9
170	Solon Springs, Wis.	1	39.4
300	Bayfield, Wis.	2	40.9
	Regional average		39.3
	NORTHEASTERN WIS.-SOUTHERN UPPER PENINSULA		
10	Trout Lake, Wis.	2	39.9
19	Iron Mountain, Mich.	1	40.0
220	Brussels, Wis.	2	41.1
295	Wis.-Upper Peninsula (commercial seed)	4	39.5
298	Trout Lake, Wis.	1	42.0
	Regional average		40.5
	CENTRAL WISCONSIN		
60	Kilbourn	1	37.1
61	Tomah	1	39.8
64	Menominee	1	39.8
104	Holmen	1	38.2
108	Black River Falls	2	40.1
108a	Black River Falls	2	39.8
	Regional average		39.1
	LOWER MICHIGAN AND ADJACENT ONTARIO, CANADA		
30	Houghton Lake, Mich.	2	40.3
81	Huron N. F., Mich.	2	41.8
117	Angus, Ontario, Canada	2	39.7
189	Bay City, Mich.	1	37.6
	Regional average		39.9
	Average all regions		39.8